Trade in intermediate goods and regional production networks. An application for Latin America

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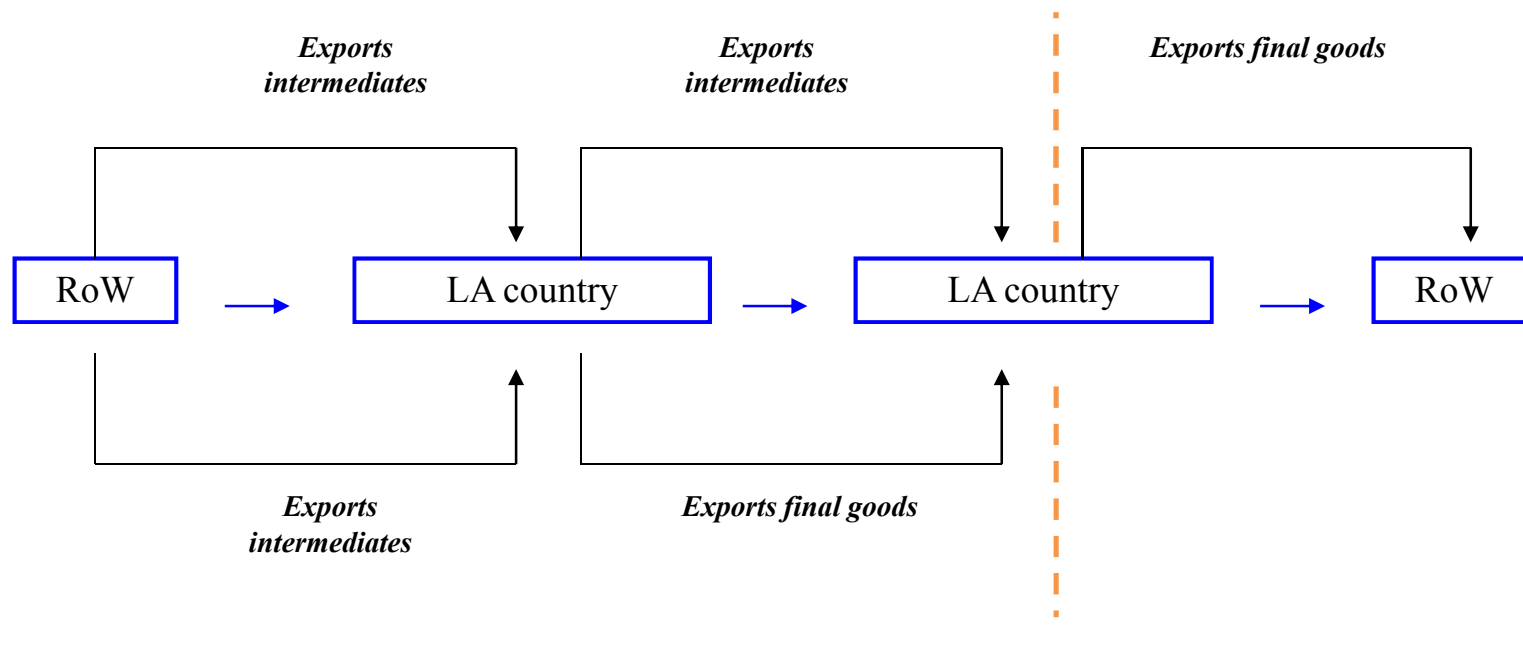Inmaculada Martínez-Zarzoso

María Luisa Recalde

Previous Literature

- Trend -- The most labour-intensive stages are relocated in developing countries to take advantage of their lower labour costs (Yeats, 2001; Barba-Navaretti Haaland and Venables, 2002; Zeddies, 2007)

- **EU-developing countries**:
  - EU integration -- $\uparrow$ intermediate goods trade
  - $\uparrow$ participation of integrating countries in European production networks
  - Blázquez, Diaz-Mora and Gandoy (2009) –Spain with CEEC (automotive sector)
  - Márquez-Ramos and Martínez-Zarzoso, 2011- EU with Maghreb (manufactures)

Objective

Examine the involvement of Latin American countries into regional production networks

H2: Dynamic Effect

Exports intermediates   *Exports intermediates*   *Exports final goods*

| RoW | → | LA country | → | LA country | → | RoW |

Exports intermediates   *Exports final goods*

H1: Static Effect

Motivation: The road to integration

- Some important dates for the regional integration in Latin America:

    - *LAIA (Montevideo Treaty, 1980) aims to establish an economic preferential system within the LA region.*
        - Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela.

    - *Mercosur (Asuncion Treaty, 1991) established a free trade area within Argentina, Brazil, Paraguay and Uruguay.*

    - *1995 – The common external tariff (CET) enters into force in Mercosur.*

> **Has trade of intermediates increased?**
> **Do imports of intermediates in LA lead to higher exports of final and intermediate goods towards LA countries?**
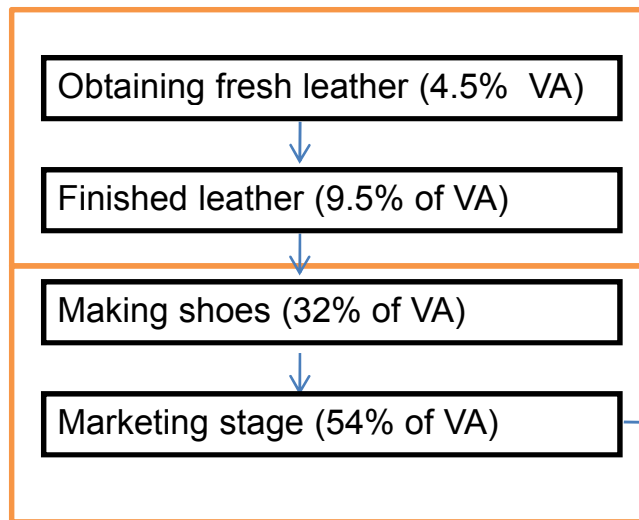
Motivation: The road to integration

- Vertically integrated production networks

The case of the Leather Value Chain,
Argentine Industrial Association (2005)

-**Argentina** is specialised in exports of low VA (X tanned leather to China, US, Italy, Mexico and Brazil)

-**Argentina** imports high VA products (M footwear from Brazil and China)

| Obtaining fresh leather (4.5% VA) |
| Finished leather (9.5% of VA) |
| Making shoes (32% of VA) |
| Marketing stage (54% of VA) |

An example of a **global commodity network** in the 80s (Korzeniewicz, 1992):

-**Argentina** exported leather to Brazil

-**Brazil** manufactured leather shoes

-The **US** imported Brazilian leather footwear

Pair of shoes for men

- Interview with a key representative of the industry (BsAs) – not more GCN in the footwear industry between Argentina-Brazil… at least not with Brazil

Motivation: The road to integration

- *Mercosur* automotive value chain: The case of Fiat (Ciravegna, 2003)

  - Generalized trend in *Mercosur* during the 90s – produce globalized and regionalised new cars

  - Regional integration can in certain circumstances create appropriate conditions for multinationals to upgrade their operations in developing countries

  - P178's global-regional production network (BR-TK-AR-PL) was interrupted as Argentinean crisis kicked in

> **Need of empirical evidence for the dynamics of regional product integration in Latin America**

Intermediate trade goods in LA

% intermediate/total imports 1994
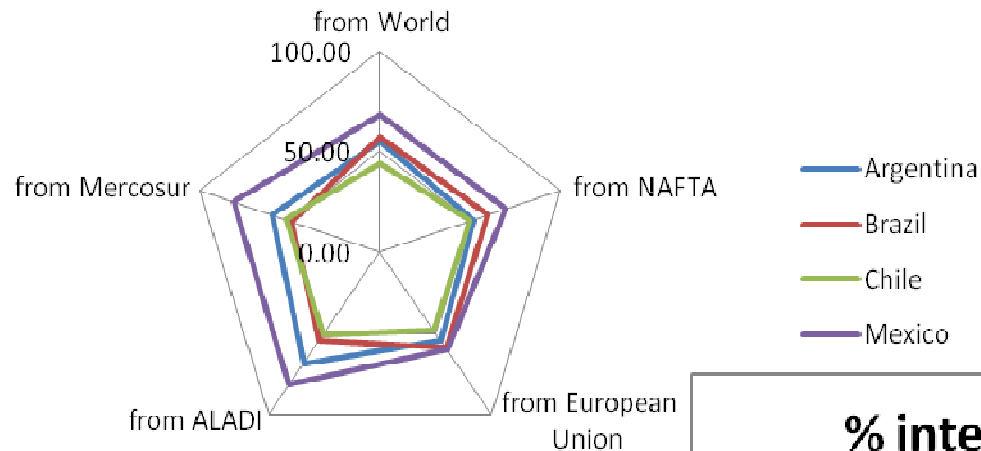
- ↑ importance of imports of intermediates in LA, from world

- ↑ importance of imports of intermediate goods in LA, from NAFTA and the EU

- Importance of imports of intermediates only increased in Bolivia, Brazil, Ecuador and Paraguay when they originate in LAIA and Mercosur
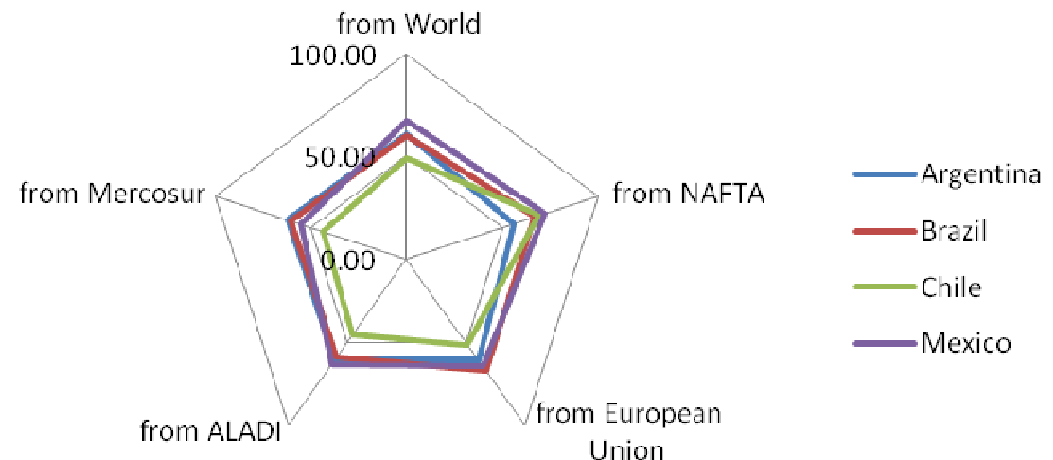
% intermediate/total imports 2008

Different patterns:
-Import more intermediates from the region: Brazil
-Import more intermediates from other integration agreements: Chile and Mexico
-Import more intermediates from other countries in the world (as could be the case of increasing imports of intermediate goods originated in China)

Main hypotheses

– H1: Latin American countries have become **more integrated** into regional production networks within LAIA (Mercosur)

  $\uparrow$ imports of intermediate goods == $\uparrow$ exports of final goods to LA

– H2: The effect of the LA agreements may have fostered the **relocation of production**. This relationship may be ambiguous:

  • "Substitution": $\uparrow$ imports of intermediate goods == $\downarrow$ exports of intermediate goods to LA

  • "Complementary" : $\uparrow$ imports of intermediate goods == $\uparrow$ exports of intermediate goods to LA

> Would reveal an even stronger and complex integration relationship through various stages of production

Related Hypotheses

- H3: The effect of regional integration on production networks differs by sector

- H4: The effect of regional integration on production networks in LAIA and Mercosur differs

- H5: The existence of the strongest LA regional production networks may have been limited in the period immediately after the creation of the Southern Common Market

Trade equation and trade statistics

- Policy implication: Bilateral trade statistics can be misleading with production networks (f.e. GCN in leather footwear in the 80s)

    - Bilateral Brazilian/Argentinean trade deficit increases by the factory cost of leather imported

    - Brazilian trade superavit increases to a higher extent as sells leather footwear to the US

    - Argentina gets only a few dollars

    - The standard practice of using the GDP of origin and destination countries as the mass variables in the gravity equations might be inappropriate for bilateral flows where parts and components are important. (Baldwin and Taglioni, 2011)
        - Trade is measured on a gross sales basis
        - GDP is measured on a net basis
    - Need to capture demand for intermediate goods used in exports

Final versus Intermediate good

Classification by Broad Economic Classification:

1 - Food and beverages
 11 – Primary (111- life animals, fruits and vegetables, soy beans,…)
 12 – Processed (121- meat, fats and oils, sugars, …)
2 - Industrial supplies not elsewhere specified
 21 – Primary (hair, life plants, tobacco (unmanufactured), mineral, raw hides and skins , wood, wool and cotton, precious stones not mounted…)
 22 – Processed (pharmaceutical goods, fertilizers, containers (boxes, bags etc), leather, tanned or dressed furskins,…)

3 - Fuels and lubricants
 31 - Primary
 32 - Processed

4 - Capital goods (except transport equipment), and parts and accessories thereof
 41 - Capital goods (except transport equipment)
 42 - Parts and accessories
5 - Transport equipment and parts and accessories thereof
 51 - Passenger motor cars
 52 - Other
 53 - Parts and accessories
6 - Consumer goods not elsewhere specified
 61 - Durable
 62 - Semi-durable
 63 - Non-durable

7 - Goods not elsewhere specified Revealed Comparative Advantage dynamics in intermediate goods.

Data and variables

- Trade in goods between 11 LAIA members (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela) over the period 1991-2008

- Tariffs, exchange rates, income, geographical variables

- BEC correspondences:

Final	Intermediate
51, 52	53
61, 62, 63	21, 22
112, 122	111,121
41	42

Methodology: gravity

- We estimate:

Hypothesis (1)

$$\ln\left(\frac{X\_final_{ijkt}}{Y_i \cdot Y_j}\right) = \alpha_0 + \alpha_1 \cdot \ln Dist_{ij} + \alpha_2 \cdot contig_{ij} + \alpha_3 \cdot \ln ER_{ijt} + \alpha_4 \cdot Merc_{ijt} +$$

$$+ \alpha_5 \cdot \ln tariff\_final_{jikt} + \alpha_6 \cdot land_i + \alpha_7 \cdot land_j + \alpha_8 \cdot \ln M\_int_{ikt} + \gamma_{it} + \phi_{jt} + s_k + \varepsilon_{ijkt}$$

$\uparrow$ Gross buyouts -- $\uparrow$ gross output

Hypothesis (2)

$$\ln\left(\frac{X\_int_{ijkt}}{Y_i \cdot Y_j}\right) = \beta_0 + \beta_1 \cdot \ln Dist_{ij} + \beta_2 \cdot contig_{ij} + \beta_3 \cdot \ln ER_{ijt} + \beta_4 \cdot Merc_{ijt} +$$

$$+ \beta_5 \cdot \ln tariff\_int_{jikt} + \beta_6 \cdot land_i + \beta_7 \cdot land_j + \beta_8 \cdot \ln M\_int_{ikt} + \eta_{it} + \varphi_{jt} + z_k + \delta_{ijkt}$$

Methodology: gravity

Hypothesis (1)

n.s.

$$\ln\left(\frac{X\_final_{ijkt}}{Y_i \cdot Y_j}\right) = \alpha_0 + \alpha_1 \cdot \ln Dist_{ij} + \alpha_2 \cdot contig_{ij} + \alpha_3 \cdot \ln ER_{ijt} + \alpha_4 \cdot Merc_{ijt} +$$

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-0.104*** [1991-2008]
-0.169***[1991-1999]
-0.087***[2000-2008]

Hypothesis (2)

$$\ln\left(\frac{X\_int_{ijkt}}{Y_i \cdot Y_j}\right) = \beta_0 + \beta_1 \cdot \ln Dist_{ij} + \beta_2 \cdot contig_{ij} + \beta_3 \cdot \ln ER_{ijt} + \beta_4 \cdot Merc_{ijt} +$$

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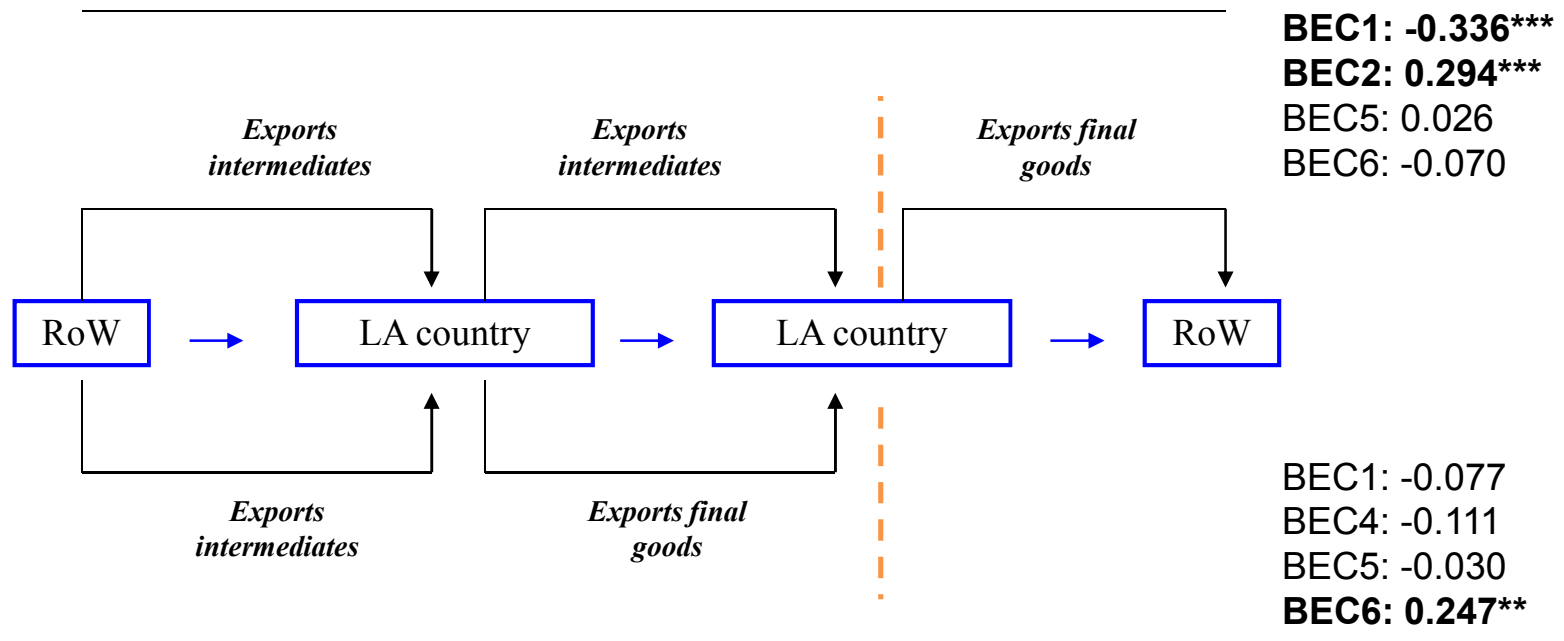
-0.084*** [1991-2008]
-0.115***[1991-1999]
-0.061***[2000-2008]

Main results

- **H3:** The effect of regional integration on production networks differs by sector
- Evidence of H1 in sector BEC6 (consumer goods)
- Evidence of H2
  - "Substitution" effect in sector BEC1 (food and beverages)
  - "Complementary" effect in BEC2 (industrial products)

H2

BEC1: -0.336***
BEC2: 0.294***
BEC5: 0.026
BEC6: -0.070

BEC1: -0.077
BEC4: -0.111
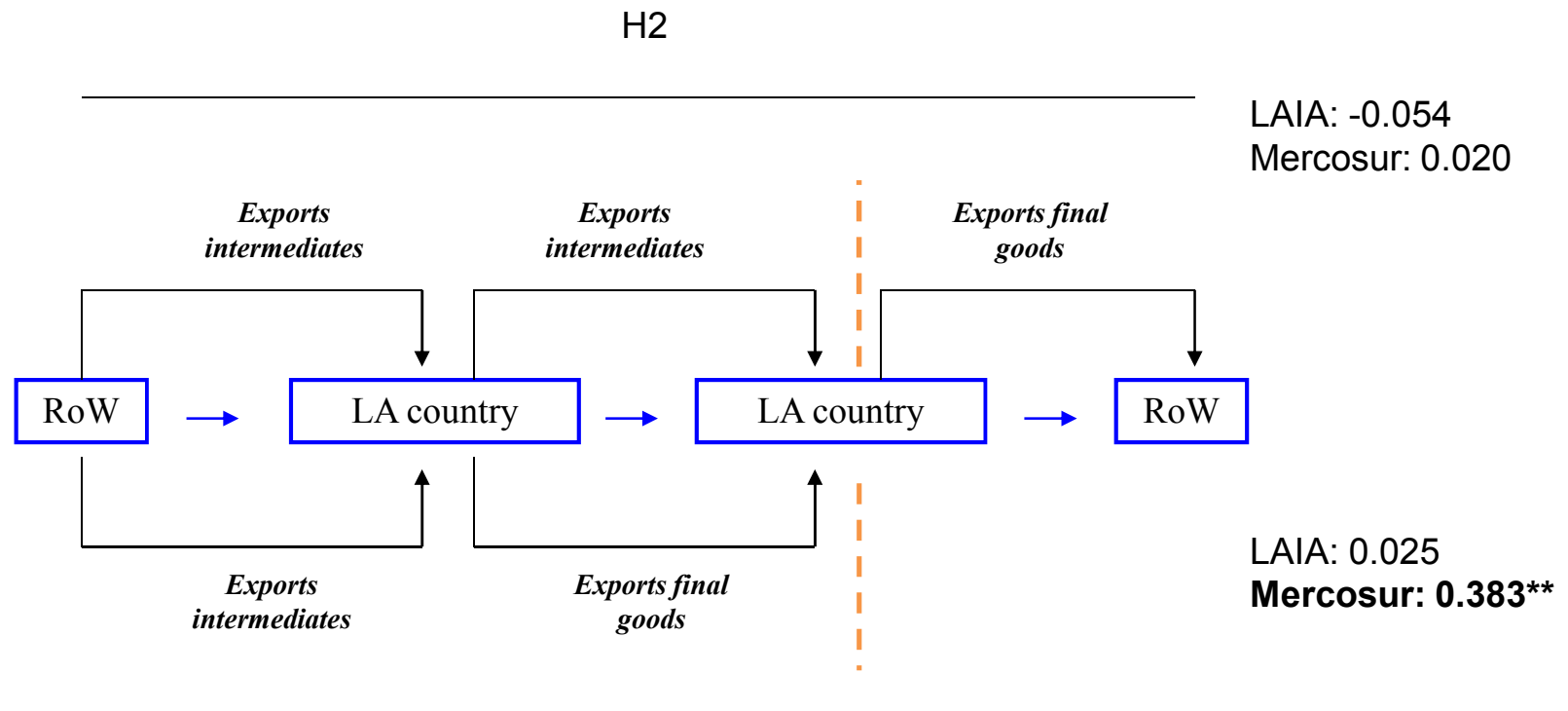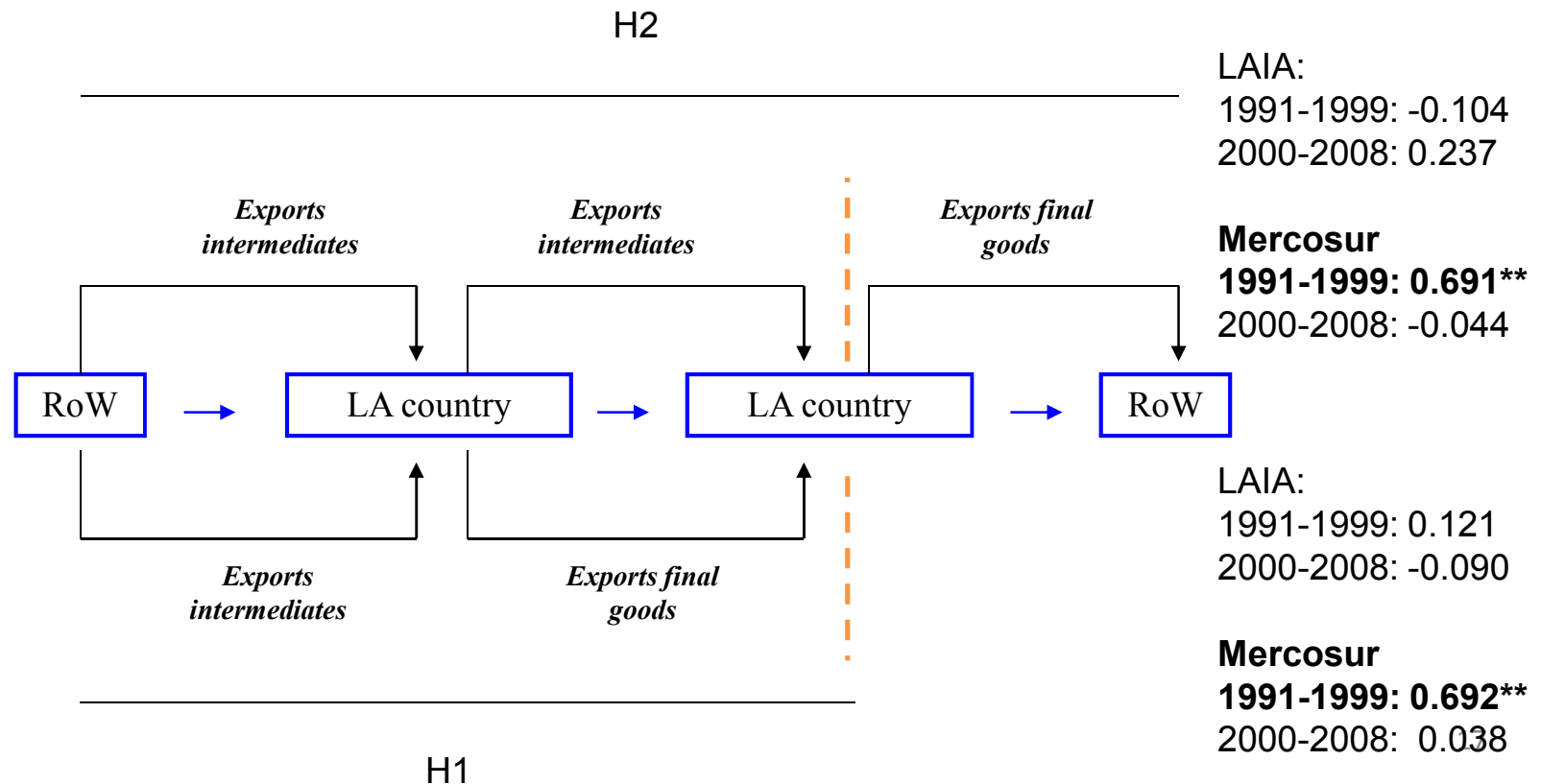BEC5: -0.030
BEC6: 0.247**

H1

Main results

- **H4:** The effect of regional integration on production networks in LAIA and Mercosur differs
- Evidence of H1 among Mercosur members over the period 1991-2008
- No evidence of H2 among neither Mercosur nor LAIA countries over the period 1991-2008

H2

LAIA: -0.054
Mercosur: 0.020

Exports intermediates   *Exports intermediates*   *Exports final goods*

RoW → LA country → LA country → RoW

Exports intermediates   *Exports final goods*

LAIA: 0.025
Mercosur: 0.383**

H1

Main results

- **H5:** The existence of the strongest LA regional production networks may have been limited in the period immediately after the creation of the Southern Common Market
- Evidence of H1 and H2 ("complementarity") among Mercosur members over the period 1991-1999

H2

LAIA:
1991-1999: -0.104
2000-2008: 0.237

**Mercosur
1991-1999: 0.691****
2000-2008: -0.044

LAIA:
1991-1999: 0.121
2000-2008: -0.090

**Mercosur
1991-1999: 0.692****
2000-2008: 0.038

H1

Conclusions

- Evidence of H1 in sector BEC6
  - $\uparrow$ imports of industrial products from RoW== $\uparrow$ exports of consumer goods to LA

- Evidence of H2: "Substitution" effect in BEC1 and "Complementary" effect in BEC2
  - $\uparrow$ imports of intermediate food and beverages from RoW== $\downarrow$ exports of intermediate food and beverages to LA
  - $\uparrow$ imports of industrial products from RoW == $\uparrow$ exports of industrial products to LA

- The effect on regional production networks is higher in Mercosur than in LAIA (not significant)
  - Evidence of H1 and H2 ("complementariety") among Mercosur members over the period 1991-1999, but not over the period 2000-2008

- Robustness: to model trade costs (imports of intermediates from RoW) to estimate by IV

¡¡¡¡Gracias!!!!